

Notice of Allowability

Application No.

10/088,685

Examiner

Roberts Culbert

Applicant(s)

FUJITA ET AL.

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 9-15.
3. ☒ The drawings filed on 21 March 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☒ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 3/21/02
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Charles A. Wendel on 2/23/04.

The application has been amended as follows:

Claims 1-8 and 16-39 are cancelled.

Oath/Declaration

Applicant is required to submit a substitute declaration or oath since the oath/declaration on file is missing the last page. The substitute oath or declaration must be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability" (PTO-37). Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136. Failure to timely file the substitute declaration (or oath) will result in **ABANDONMENT** of the application. The transmittal letter accompanying the declaration (or oath) should indicate the date of the "Notice of Allowance" (PTOL-85) and the application number in the upper right hand corner.

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- I. Claims 1-8 and 16-35, drawn to an apparatus for fine pattern formation, classified in class 347, subclass 47.

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- II. Claims 9-15, drawn to a method of forming print head nozzles, classified in class 216, subclass 27.
- III. Claims 36-39, drawn to a method of using a print head, classified in class 347, subclass 37.

The inventions listed as Groups I, II, and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because Group I does not share the special technical feature of Group II of forming the protruded silicon oxide nozzles by removing a portion of the silicon nitride layer and a portion of the silicon substrate. Although groups I and II share the feature of the protruded nozzles, the nozzle formation technique and not the nozzles themselves defines the contribution over the prior art.

Groups II and III do not relate to a single general inventive concept under PCT Rule 13.1 because Group III does not share the special technical feature of Group II of forming the protruded silicon oxide nozzles by removing a portion of the silicon nitride layer and a portion of the silicon substrate.

Groups I and III do not relate to a single general inventive concept under PCT Rule 13.1 because Groups I and III do not share any special technical relationship involving a special technical feature, where the special technical feature defines a contribution over the prior art.

During a telephone conversation with Charles A. Wendel on 2/17/04 a provisional election was made with traverse to prosecute the invention of Group II, claims 9-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-8, and 16-39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Allowable Subject Matter

Claims 9-15 are allowed.

The following is an examiner's statement of reasons for allowance:

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The prior art of record fails to point out or render obvious a process for producing a plurality of fine nozzles formed of silicon oxide, protruded from one surface of a silicon substrate and in communication with fine holes which extend through the silicon substrate and have a silicon oxide layer on the wall surface thereof, said process comprising: a first step of providing a silicon substrate having on its whole surface a silicon nitride layer and forming a mask pattern having a plurality of fine openings on the silicon nitride layer in its portion located on one surface of the silicon substrate, a second step of forming through fine holes in the silicon substrate by deep etching using the mask pattern as a mask; a third step of removing the mask pattern and oxidizing the inside of the through fine holes of the silicon substrate to form a silicon oxide layer; and a fourth step of removing part of the silicon nitride layer and a part of the silicon substrate from one surface of the silicon substrate by dry etching to expose the silicon oxide layer by a predetermined length, thereby forming fine nozzles.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,047,184 to Bassous et al. teaches the formation of an oxide layer on the sidewalls of an ink channel for protection against ink corrosion. U.S. Patent 4,601,777 to Hawkins et al. teaches forming ink channels in a silicon substrate using a silicon nitride mask.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert

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*P. Hassanzadeh
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